

EXHAUST TREATMENT DEVICES, CATALYST, AND METHODS OF MAKING  
AND USING THE SAME

ABSTRACT

[0037] In one embodiment, an exhaust treatment device includes: a substrate, a shell disposed around the substrate, and a retention material disposed between the shell and the substrate. The substrate includes a catalyst that includes a precious metal and a solid solution comprising solid solution metals, wherein the solid solution metals include yttrium, zirconium, and titanium.